

40l.; H. C. Bathurst, Dulwich College, 40l.; E. T. Lancaster, Exeter School, 30l.; G. D. Roechling Winchester College, 30l.

THE death is announced, at the age of forty-nine, of Dr. W. R. Harper, president of Chicago University.

THE council of the University of Sheffield has appointed Dr. Louis Cobbett professor of pathology, and Mr. L. T. O'Shea professor of applied chemistry in the University.

SIR MICHAEL FOSTER, K.C.B., F.R.S., will preside at the meeting of the Public Schools Science Masters' Association at Westminster School on Saturday, January 20, in place of the president, Sir Oliver Lodge, F.R.S., who is prevented from being present.

WE learn from *Science* that at the recent special session of the State legislature the University of Wisconsin was again authorised to draw its income from the general fund of the State treasury, as according to the new method of appropriating funds for the university by setting aside two-sevenths of a mill on all taxes, the university income fund does not become available until February each year, whereas the university budget has always been estimated on the basis of the fiscal year, which extends from July 1 to June 30 of each year.

ON Saturday, January 13, the first annual dinner was held of the past chemical students of the Technical College, Finsbury. Prof. R. Meldola, F.R.S., took the chair, and there were present, in addition to the lecturers and demonstrators of the chemical department, seventy past students of the college. Prof. Meldola referred with pride to the number of past students, who had won distinction in the chemical world, and were gathered around him. Finsbury was one of the earliest technical colleges, and had a record of a quarter of a century's usefulness to the technical industries of the country. Dr. Moody, who proposed "The College," said that this year was a very appropriate one for the first annual dinner, as their head, Prof. Meldola, now held the highest distinction the Chemical Society had to offer, the office of president.

A DISCUSSION has been opened in *L'Enseignement mathématique* on the reforms to be accomplished in the teaching of mathematics, and numerous mathematicians have been asked to state their opinions on the conditions that should be satisfied by a complete course of mathematics, theoretical and practical, in institutions of higher grade. The questions are as follows:—What improvements should be effected in the teaching of pure mathematics? What part should be played by higher educational institutions in preparing teachers for secondary schools? And how should mathematical teaching be organised in order that it may respond better than hitherto to the requirements of other branches of pure and applied science? Of those who have already taken part in this referendum, we note the names of Prof. Gino Loria (Genoa), Prof. Emile Borel (Paris), Prof. Jules Andrade (Besançon), Prof. D. E. Smith (Columbia University), Prof. F. Mariotte (Paris).

SOCIETIES AND ACADEMIES.

LONDON.

Royal Microscopical Society, December 20, 1905.—Dr. Dukinfield H. Scott, F.R.S., president, in the chair.—An exhibit consisting of about twenty photographs of diatoms taken by the Zeiss apparatus, designed by Dr. August Köhler, of Jena, for photomicrography with ultra-violet light: Mr. **Rheinberg**. The objective and other lenses used in taking the photographs were made wholly of fused quartz, which rendered possible the utilisation of ultra-violet light having a wave-length of 275μ ($=275$ millionths of a millimetre). The photographs were taken with a 1.7 mm. monochromatic objective of 1.25 N.A., using light from the cadmium spark. The resolving power was therefore as great as would be that of an objective used with ordinary light if it were possible to give it an N.A. of 2.5. There were photographs of *Surirella gemma* and *Amphipleura pellucida*; one of the latter taken with oblique illumination showed the diatom clearly resolved into dots. There were also comparison photographs of the same diatoms, taken with a 2 mm.

apochromatic objective of 1.4 N.A. using light from the magnesium spark ($\lambda=383 \mu$) giving about the same amplification, viz. about 1800 diameters. The difference in the appearance of the images was very apparent.—A fern fructification from the lower Coal-measures of Shore, Lancashire: D. M. S. **Watson**.

Linnean Society, December 21, 1905.—Mr. C. B. Clarke, F.R.S., vice-president, in the chair.—(1) An aposporous seedling of *Polypodium vulgare*, with a frond bearing a well defined prothallus at the tip. (2) A new case of apospory in *Cystopteris montana*: C. T. **Druery**.—The International Botanical Congress at Vienna in June last: Dr. A. B. **Rendle**. A report was given on the work of the congress, and in particular on the proposals of the conference on botanical nomenclature (see *NATURE*, vol. lxxii., p. 272, 1905).—Cyrtandreae Malayae insularis novae: Dr. F. **Kränzlin**.—On Characeae from the Cape of Good Hope collected by Major A. H. Wolley-Dod, R.A.: H. and J. **Groves**.

Mathematical Society, January 11.—Prof. Forsyth, president, in the chair.—On the monogeneity of an algebraic function: Dr. H. F. **Baker**.—On the diffraction of sound by large cylinders: J. W. **Nicholson**.—On the expression of the so-called biaternions and triaternions by quaternary matrices: J. **Brill**.—Dr. E. W. **Hobson** made an informal communication On the representation of functions of real variables.

PARIS.

Academy of Sciences, January 8.—M. Poincaré in the chair.—On a method allowing of the determination of the constant of an absolute electrodynamic meter with the aid of an induction phenomenon: G. **Lippmann**. In the determination of the constant of an absolute electrodynamic meter, the conditions imposed by the calculation if accuracy of measurement is aimed at are the opposite of the conditions for sensitiveness. In the method proposed in the present paper, the experimental measurement is reduced to finding the equilibrium position of a galvanometer, and measuring either an angle or a length.—On comets, and the curvature of their solar trajectory: Émile **Belot**.—On plane transformations: M. **Hadamard**.—On the non-stationary motion of a fluid ellipsoid of revolution which does not change its figure during the motion: W. **Stekloff**.—On the stability of aéroplanes and the rational construction of supporting planes: Edmond **Seux**.—On the variation of the emission spectra of some electric lamps with temperature: P. **Vaillant**. The lamps studied were the Cooper-Hewitt mercury lamp, the tantalum filament, the Nernst, and the ordinary carbon filament lamps. Figures are given showing the variations in the composition and intensity of the light with the number of watts consumed by each lamp.—On a new type of compound in the group of rare metals: C. **Matignon** and E. **Cazes**. At a high temperature samarium chloride, SmCl_3 , is slowly reduced in a current of hydrogen to a lower chloride, the analyses agreeing with the formula SmCl_2 . This lower chloride was obtained by other methods, the complete absence of moisture being the one condition essential. The chlorides of praseodymium and neodymium do not undergo a similar reduction by hydrogen.—The electrolytic preparation of spongy tin: D. **Tommasi**. The electrolytic solution is made up of stannous chloride (10), hydrochloric acid (1), and water (50), and the tin is deposited on a rotating cathode.—On cuprous-silicide: Em. **Vigouroux**. The author has repeated and confirmed his earlier experiments on this subject, and shows that in pure silicides of copper the amount of combined silicon is about 10 per cent.; the crystallised cuprous silicide, Cu_2Si , has been isolated and its principal properties determined.—The reduction of the chlorides of silver and copper by calcium: L. **Hackspill**. The reduction of silver chloride by calcium gives rise to a series of alloys of calcium and silver varying according to the proportion of calcium used. The reduction of cuprous chloride gave similarly a copper-calcium alloy.—Asymmetrical derivatives of 1:6-hexanediol; the diethyl ether and di-iodide of 1:7-heptanediol: R. **Dionneau**.—On the conditions of hydrogenation of some halogen derivatives of fatty hydrocarbons by the metal ammoniums. The preparation of ethylenic and acetylenic hydrocarbons: E. **Chablay**. Sodium, dissolved in liquid ammonia, acts

upon ethylene chloride quantitatively according to the equation $C_2H_4Cl_2 + 2NH_3 \cdot Na = 2NaCl + C_2H_4 + 2NH_3$. The homologues of ethylene bromide give unsaturated hydrocarbons similarly, but there are secondary reactions. With compounds of the type $R \cdot CHCl_2$, the alkali-ammonium reacts differently, giving the paraffin $R \cdot CH_3$.—On the retrogradation and composition of natural starch other than potato starch: Eug. Roux.—The action of invertin in a heterogeneous medium: Victor Henri.—On solid solutions: Fréd. Wallerant.—On the secretory canals in the wood of *Dipterocarpus*: P. Guérin.—On the respiration of the flower: M. Maige.—The composition of the fluids which circulate in the plant; variations of nitrogen in the leaves: G. André.—On hordenine, a new alkaloid extracted from the germs of barley: E. Léger. The alkaloid forms anhydrous crystals of the composition $C_{10}H_{15}NO$. It is a strong tertiary base, forming easily crystallisable salts.—Hordenine, its degree of toxicity and symptoms of poisoning: L. Camus. This alkaloid is not highly toxic; death, when it is produced by a large dose, is determined by an arrest of respiration.—On the echinoderms collected by the French Antarctic Expedition under Dr. Charcot: R. Koehler.—On the value of the magnetic elements at the observatory at the Val-Joyeux on January 1: Th. Moureaux.—Deep marine currents in the North Atlantic: A. Chevallier.

DIARY OF SOCIETIES.

THURSDAY, JANUARY 18.

ROYAL SOCIETY, at 4.30.—The Factors which Determine the Production of Intracellular Fluid: E. E. Henderson and Prof. E. H. Starling, F.R.S.—A Critical Account of some Anomalous Conditions of the Cerebrum in the Human Fœtus: Dr. W. L. H. Duckworth.—A Case of Regeneration in Polychæte Worms: A. T. Watson.—On the Infection, Histology, and Development of the Uredo Stage in certain Uredineæ: I. B. P. Evans.—On the Synapsis in Amphibia: J. E. S. Moore and Miss A. L. Embleton.—On the Constancy of Form among the Synaptic Gemini (Heterotype Chromosomes) in certain Animals: J. E. S. Moore and G. Arnold.—The Growth of the Oocyte in Antedon: a Morphological Study in the Cell Metabolism: G. C. Chubb.—Observations on the Life History of Leucocytes: C. E. Walker.—A Study of the Mechanism of Carbon Assimilation in Green Plants: F. L. Usher and J. H. Priestley.—Note on the Progeny of Chestnut Thoroughbred Horses: W. F. R. Weldon, F.R.S.

CHEMICAL SOCIETY, at 8.30.—The Refractive Indices of Crystallising Solutions with Especial Reference to the Passage from the Meta-stable to the Labile Condition: H. A. Miers and F. Isaac.—The Determination of Available Plant Food in Soils by the Use of Weak Acid Solvents. Part II.: A. D. Hall and A. Amos.—The Action of Ammonia and Amines on Diazobenzene Picrate: O. Silberrad and G. Rotter.—The Preparation of *p*-Bis-triazobenzene: O. Silberrad and B. J. Smart.—Gradual Decomposition of Ethyl Diazoacetate: O. Silberrad and C. S. Roy.—Studies on Nitrogen Iodide. Part III. The Action of Methyl and Benzyl Iodides: O. Silberrad and B. J. Smart.—Silicon Researches. Part X. Silicon Thiocyanate: J. E. Reynolds.—The Relations between Absorption Spectra and Chemical Constitution. Part I. The Chemical Reactivity of the Carbonyl Group: A. W. Stewart and E. C. C. Baly.—Halogen Derivatives of Substituted Oxamides: F. D. Chattaway and W. H. Lewis.—The Effect of Constitution on the Rotatory Power of Optically Active Nitrogen Compounds. Part I.: Miss M. B. Thomas and H. O. Jones.—Menthyl Benzene Sulphonate and Menthyl- β -Naphthalene Sulphonate: T. S. Patterson and J. Frew.—An Apparatus for the Continuous Extraction of Liquids with Ether: R. S. Bowman.—Action of Bromine on Benzeneazo-*o*-Nitrophenol: J. T. Hewitt and N. Walker.—Some Reactions and New Compounds of Fluorine. Part I.: E. B. R. Prideaux.—The Relation between Absorption Spectra and Chemical Reactivity. Part II. The Quinones and α -Diketones: E. C. C. Baly and A. W. Stewart.—The Relation between Absorption Spectra and Chemical Reactivity. Part III. The Nitroanilines and the Nitrophenols: E. C. C. Baly, W. H. Edwards, and A. W. Stewart.—Contributions to the Chemistry of the Rare Earths. Part I.: M. Esposito.—A Synthesis of Aldehydes by Grignard's Reaction: G. W. Monier Williams.—The Condensation of Dimethyldihydroresorcin and of Chloroketodimethyl-tetrahydrobenzene with Primary Amines. Part I. Monamines, Ammonia, Aniline, and *p*-Toluidine: P. Haas.

SOCIETY OF ARTS, at 4.30.—The City of Calcutta: C. E. Buckland.—At 8.0.—High Speed Electric Machinery, with Special Reference to Steam-Turbine Machines: Prof. S. P. Thompson, F.R.S.

LINNEAN SOCIETY, at 8.—The Life-history of *Margaritifera Panasesæ*: A. W. Allen.—On some Endophytic Algae: A. D. Cotton.—Jacobson's Organ of *Sphenodon*: Dr. R. Broom.

FRIDAY, JANUARY 19.

ROYAL INSTITUTION, at 9.—Some Applications of the Theory of Electric Discharge to Spectroscopy: Prof. J. J. Thomson, F.R.S.

INSTITUTION OF MECHANICAL ENGINEERS, at 8.—Behaviour of Materials of Construction under Pure Shear: E. G. Izod (*Resumed Discussion*): Worm Contact: R. A. Bruce.

MONDAY, JANUARY 22.

SOCIOLOGICAL SOCIETY, at 8.—Sociology as an Academic Subject: Prof. R. M. Lacey.

TUESDAY, JANUARY 23.

ROYAL INSTITUTION, at 5.—Impressions of Travel in China and the Far East: Prof. E. H. Parker.

INSTITUTION OF CIVIL ENGINEERS, at 8.—*Resumed Discussion*: The Elimination of Storm-water from Sewerage Systems: D. E. Lloyd-Davies.—On the Elimination of Suspended Solids and Colloidal Matters from Sewage: Lieut.-Colonel A. S. Jones and Dr. W. O. Travis.

MINERALOGICAL SOCIETY, at 8.—Studies in Crystallisation: Prof. Mers and Mr. Chevallier.—The Chemical Composition of Geikielite: Mr. Jones and Mr. Crook.

ANTHROPOLOGICAL INSTITUTE, at 8.30.—Annual General Meeting. President's Address: Copper and its Alloys in Antiquity.

WEDNESDAY, JANUARY 24.

SOCIETY OF ARTS, at 8.—The Planting of Waste Lands for Profit: Dr. J. Nisbet.

GEOLOGICAL SOCIETY, at 8.—The Buttermere and Ennerdale Granophyre: Robert Heron Rastall.—On the Igneous and Associated Sedimentary Rocks of Llangynog (Caermarthenshire): T. Crosbie Cantrill and Herbert Henry Thomas.

THURSDAY, JANUARY 25.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: Experiments on the Chemical Behaviour of Argon and Helium: Dr. W. T. Cooke.—The Vapour Pressure in Equilibrium with Substances holding Varying Amounts of Moisture. Parts I. and II.: Prof. F. T. Trouton, F.R.S., and Miss B. Poole.—Note on Heusler's Magnetic Alloy of Manganese, Aluminium and Copper: Prof. A. Gray, F.R.S.—On the Overstraining of Iron by Tension and Compression: Dr. J. Muir.—On the Effect of High Temperature on Radium Emanation: W. Makower.—Observations and Photographs of Black and Grey Soap Films: H. Stansfield.—Artificial Double Refraction due to \mathcal{A} olotropic Distribution, with Application to Colloidal Solution and Magnetic Fields: T. H. Havelock.—An Electrical Measuring Machine for Engineering Gauges and other Bodies: Dr. P. E. Shaw.—The Relation between the Osmotic Pressure and the Vapour Pressure of a Solution: W. Spens.—The Elliptic Integral in Electromagnetic Theory: Prof. A. G. Greenhill, F.R.S.—On the Simple Group of Order 25920: Prof. W. Burnside, F.R.S.

SOCIETY OF ARTS, at 8.—High Speed Electric Machinery, with Special Reference to Steam Turbine Machines: Prof. S. P. Thompson, F.R.S.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Technical Considerations in Electric Railway Engineering: F. W. Carter.

FRIDAY, JANUARY 26.

PHYSICAL SOCIETY, at 5.—

INSTITUTION OF CIVIL ENGINEERS, at 8.—Prince of Wales Pier, Falmouth: T. R. Grigson.—Ferro-Concrete Pier at Purfleet: H. O. H. Etheridge.

CONTENTS.

	PAGE
The Higher Teleology. By J. A. T.	265
Two Books on the Soil	266
Recent Aspects of Elementary Geometry. By G. B. M.	267
Legibility and Visual Acuity. By J. Herbert Parsons	268
Our Book Shelf:—	
Morse: "Exercises in Quantitative Chemistry."—H. M. D.	268
Flint: "Handbook of Physiology for Students and Practitioners of Medicine."—Prof. J. S. Macdonald	269
"Penrose's Pictorial Annual"	269
Gewecke: "Philips' Large Planisphere"	269
Hann: "Lehrbuch der Meteorologie"	270
Henslow: "The Uses of British Plants"	270
Letters to the Editor:—	
Cheirality of Form of Crystals of Epsom Salt.—Dr. H. C. Pocklington	270
Deposits on Telephone Wires.—A Subscriber	270
Sounding Stones.—T. Dillon	270
More About Japan. (<i>Illustrated</i>). By E. W.	271
The Motion of the Moon. By R. A. S.	272
The Control of the Gas Supply of the Metropolis	273
Prof. C. J. Joly, F.R.S. By W. E. P.	273
Notes	274
Our Astronomical Column:—	
Comet 1905c (Giacobini)	279
Nebulosity around Nova Aquilæ	279
The Figure of the Sun	279
Stellar Magnitude of the Sun	279
Variability of Iris	279
Some Questions for Archæologists. By Sir Norman Lockyer, K.C.B., F.R.S.	280
The Skeleton of <i>Brontosaurus</i> and Skull of <i>Morosaurus</i> . (<i>Illustrated</i>). By Prof. Henry Fairfield Osborn	282
The Present Position of Radio-activity. By Frederick Soddy	285
Medical Inspection and Feeding of Children in Schools	286
University and Educational Intelligence	286
Societies and Academies	287
Diary of Societies	288